

## Student computer use

*In our increasingly technological society, computers are an essential tool. Through computers, students can access information, manipulate data, and produce results in ways that were unimaginable just a short time ago. Early exposure to computers in school can help young people gain the technological literacy that will be crucial for success in tomorrow's schools, as well as tomorrow's jobs. Changes in the frequency of student computer use and the ways in which students are using computers are indicators of the degree to which they are taking advantage of the full power of these tools.*

- Between 1984 and 1994, there was a large increase in the percentage of 4<sup>th</sup>-, 8<sup>th</sup>-, and 11<sup>th</sup>-grade students who reported using a computer at school at least once a week. This increase was paralleled by a similar decrease in the percentage of students who reported never using a computer at school.
- Younger students reported using computers more frequently than did older students. In 1994, 70 percent of 4<sup>th</sup>-graders reported using a computer at school at least once a week, compared with 46 percent of 8<sup>th</sup>-graders and 43 percent of 11<sup>th</sup>-graders. Older students were more likely to use computers every day, however.
- In 1994, more than two-thirds of 4<sup>th</sup>-graders and at least 80 percent of 8<sup>th</sup>- and 11<sup>th</sup>-graders reported using a computer to write stories or papers, a substantial increase from 1984. The percentage of students who reported using a computer to learn things also increased between 1984 and 1994 for all three grades, while the percentage of students who reported using a computer to play games remained relatively constant for 8<sup>th</sup>- and 11<sup>th</sup>-graders.
- Students from high income families have continued to be more likely to report using a computer than students from low income families. While the percentage of students who reported using a computer at school increased by similar amounts across family income levels, between 1984 and 1993, the increase in the percentage of students who reported using a computer at home was higher for students from families with higher incomes (see supplemental table 5-1).

### Percentage of students who reported using a computer at school, by grade and frequency of use: Selected years 1984–94

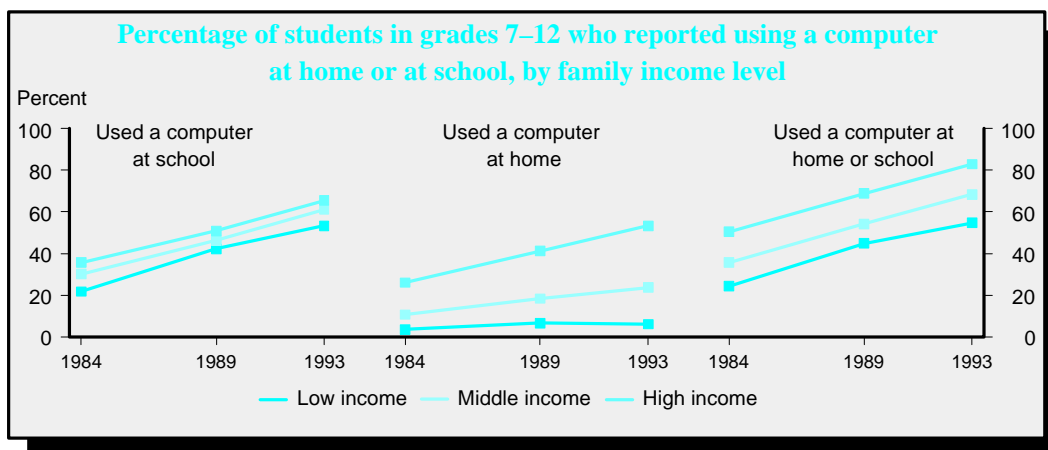
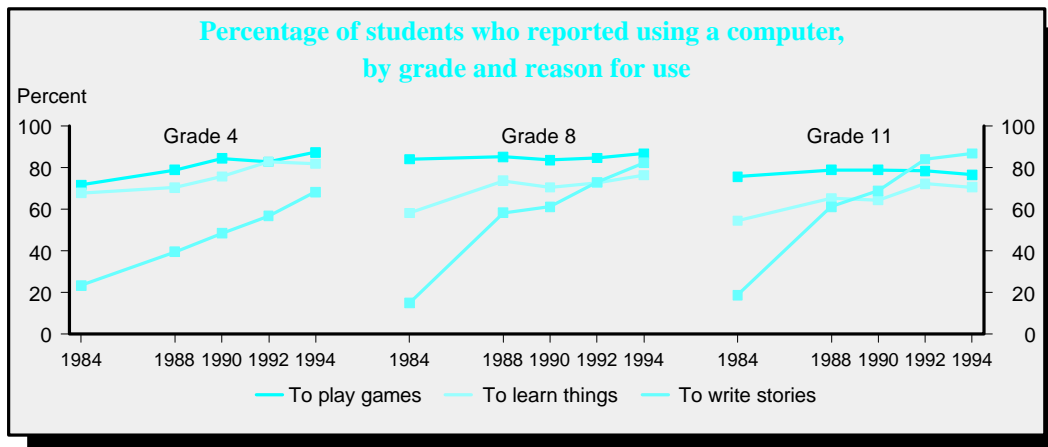
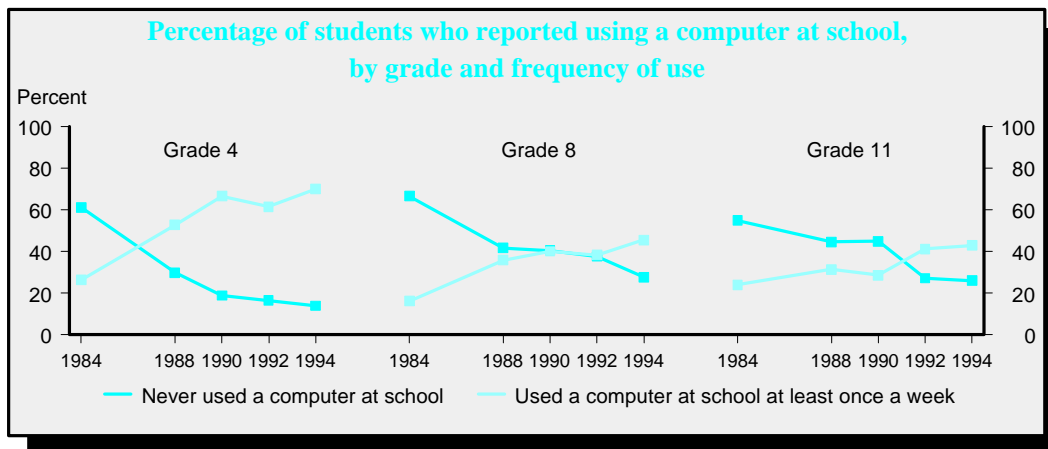
Frequency	Grade 4					Grade 8					Grade 11				
	1984	1988	1990	1992	1994	1984	1988	1990	1992	1994	1984	1988	1990	1992	1994
Never	61.2	29.8	18.9	16.5	14.0	66.7	41.8	40.5	37.6	27.7	55.0	44.7	44.9	27.2	26.1
Less than once a week	12.5	17.4	14.5	22.0	15.8	17.0	22.2	19.3	23.9	26.9	20.9	24.0	26.5	31.5	30.9
Once a week	15.5	34.2	41.1	37.0	39.6	8.1	13.9	12.9	12.8	16.1	5.7	6.4	6.6	10.8	8.0
2 or 3 times a week	7.6	15.0	17.7	18.6	22.8	4.6	12.2	16.0	15.1	14.5	6.3	9.7	8.3	11.3	12.4
Every day	3.2	3.6	7.8	5.9	7.7	3.6	9.8	11.3	10.5	14.9	12.1	15.2	13.7	19.2	22.6

### Percentage of students who reported using a computer, by grade and reason for use: Selected years 1984–94

Reason	Grade 4					Grade 8					Grade 11				
	1984	1988	1990	1992	1994	1984	1988	1990	1992	1994	1984	1988	1990	1992	1994
To play games	71.8	79.0	84.5	82.8	87.4	84.1	85.3	83.7	84.7	86.8	75.7	78.9	79.0	78.4	76.6
To learn things	67.9	70.4	75.8	82.9	82.0	58.2	73.7	70.5	72.8	76.4	54.6	65.3	64.5	72.3	70.7
To write stories or papers	23.4	39.6	48.6	56.9	68.3	15.0	58.4	61.3	73.1	82.3	18.8	61.2	68.9	84.1	86.9

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Almanac: Writing, 1984 to 1994, 1996*.

## Percentage of students who reported using a computer: Selected years 1984–94



SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Almanac: Writing, 1984 to 1994*, 1996. U.S. Department of Commerce, Bureau of the Census, October Current Population Surveys.

## Note to Indicator 5: Comparability of sources for student computer use

Two primary data sources were used for the analysis in *Indicator 5*. Each surveyed different populations for different reasons. The full citations for these data sources are as follows:

- U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Almanac: Writing, 1984 to 1994, Mathematics, 1978 to 1994, Science, 1986 to 1994*, 1996.
- U.S. Department of Commerce, Bureau of the Census, October Current Population Surveys, 1984, 1989, and 1993.

The National Assessment of Educational Progress (NAEP) Almanac data come from a survey administered to 9-, 13-, and 17-year-olds every 2 years. The questions on computer use are background questions administered to the students along with an assessment of their skills in mathematics, science, reading, and writing. The background questionnaire asks, among other things, how much

time students spend on computers and for what activities they use a computer.

The October Current Population Surveys (CPS) are administered to households each year. The computer component of these surveys is included every few years, and has questions concerning the access students in the household have to computers at school and at home. These data can be broken out by race/ethnicity and family income level to provide descriptive information on who has access to computers and where they are using them.

Because one survey is directed toward students and the other toward the heads of households, the results from the two sources are not comparable. In fact, the difference in the respondents for these two surveys may account for the inconsistencies between supplemental tables 5-1 and 5-2, including the fact that household respondents reported students using computers at home less often than students themselves reported using computers at home.

**Table 5-1 Percentage of students who reported using a computer at school or home, by grade and family income: October 1984, 1989, and 1993**

Current education level and family income*	1984			1989			1993		
	Used a computer at school	Used a computer at home	Used a computer at home or school	Used a computer at school	Used a computer at home	Used a computer at home or school	Used a computer at school	Used a computer at home	Used a computer at home or school
<b>Grades 1-6</b>									
<b>Total</b>	<b>31.3</b>	<b>12.1</b>	<b>37.2</b>	<b>54.1</b>	<b>16.6</b>	<b>58.8</b>	<b>69.7</b>	<b>24.1</b>	<b>74.0</b>
Low income	19.1	2.5	20.6	40.9	3.3	42.0	59.8	4.0	60.5
Middle income	30.2	10.0	35.4	54.0	13.5	58.1	69.1	18.8	72.6
High income	43.4	25.0	54.5	64.4	34.6	73.0	78.4	51.4	87.3
<b>Grades 7-12</b>									
<b>Total</b>	<b>30.7</b>	<b>14.3</b>	<b>38.5</b>	<b>47.0</b>	<b>23.0</b>	<b>57.0</b>	<b>61.2</b>	<b>29.7</b>	<b>70.4</b>
Low income	21.8	3.6	24.3	42.3	6.6	44.9	53.3	6.1	54.8
Middle income	30.2	10.8	35.7	46.3	18.4	54.3	61.2	23.7	68.4
High income	35.8	26.1	50.4	50.9	41.3	68.9	65.5	55.3	83.0

\* Low income is the bottom 20 percent of all family incomes; high income is the top 20 percent of all family incomes; and middle income is the 60 percent in-between.

SOURCE: U.S. Department of Commerce, Bureau of the Census, October Current Population Surveys.

**Table 5-2 Percentage of students who reported using a computer, by grade and location of use: Selected years 1984-94**

Year	At home			At school*			At the library		
	Grade 4	Grade 8	Grade 11	Grade 4	Grade 8	Grade 11	Grade 4	Grade 8	Grade 11
1984	44.8	36.6	30.3	38.8	33.3	45.0	25.2	20.5	22.2
1988	45.5	46.2	39.7	70.2	58.2	55.3	27.6	39.8	37.4
1990	43.3	41.2	42.8	81.1	59.5	55.1	34.5	35.1	46.2
1992	43.0	44.0	50.7	83.5	62.4	72.8	45.6	47.3	62.1
1994	50.0	50.1	51.0	86.0	72.3	73.9	48.1	56.8	61.3

\* Based on the percentage of students who reported ever using a computer in school.

NOTE: Data in this table may appear inconsistent with data in table 5-1 due to a difference in respondents for the two sources. See the supplemental note to this indicator for further explanation.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Almanac: Writing, 1984 to 1994*, 1996.

**Table 5-3 Percentage of students who had access to a computer and those who studied mathematics through computer instruction, by age: Selected years 1978-94**

Access to a computer and reason for use	Age 13						Age 17					
	1978	1982	1986	1990	1992	1994	1978	1982	1986	1990	1992	1994
Have access to a computer in school	12.2	22.8	46.9	44.1	49.1	47.5	24.4	49.6	57.1	54.5	57.7	51.9
Study mathematics through computer instruction	14.4	23.5	38.9	45.4	53.3	50.3	12.3	18.9	22.2	35.0	35.2	34.2

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Almanac: Mathematics, 1978 to 1994*, 1996.

**Table 5-4 Percentage of students who reported ever using a computer, or whose family owns a computer, by age: Selected years 1986-94**

Year	Ever used a computer		Family owns a computer	
	Age 9	Age 13	Age 9	Age 13
1986	75.3	89.3	27.8	31.1
1990	79.3	93.3	31.1	37.3
1992	81.8	95.3	33.5	42.2
1994	81.9	94.6	40.6	48.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Almanac: Science, 1986 to 1994*, 1996.

**Table S5-1 Standard errors for table 5-1**

	1984			1989			1993		
	Used a computer at school	Used a computer at home	Used a computer at home or school	Used a computer at school	Used a computer at home	Used a computer at home or school	Used a computer at school	Used a computer at home	Used a computer at home or school
<b>Grades 1-6</b>									
Total	0.5	0.4	0.6	0.6	0.4	0.6	0.5	0.5	0.5
Low income	1.1	0.4	1.1	1.4	0.5	1.4	1.4	0.5	1.3
Middle income	0.7	0.4	0.7	0.8	0.5	0.8	0.7	0.6	0.7
High income	1.2	1.1	1.2	1.2	1.2	1.1	1.0	1.2	0.8
<b>Grades 7-12</b>									
Total	0.5	0.4	0.5	0.6	0.5	0.6	0.6	0.5	0.5
Low income	1.2	0.6	1.3	1.6	0.8	1.6	1.5	0.7	1.5
Middle income	0.7	0.4	0.7	0.8	0.6	0.8	0.7	0.6	0.7
High income	1.0	0.9	1.0	1.2	1.2	1.1	1.0	1.1	0.8

SOURCE: U.S. Department of Commerce, Bureau of the Census, October Current Population Surveys.



**Table S5-2 Standard errors for table 5-2**

	At home		At school		At the library	
	Grade 4	Grade 8	Grade 4	Grade 8	Grade 4	Grade 8
1984	3.7	2.9	3.5	2.9	3.8	2.9
1988		2.4		3.1		3.1
	2.3	1.8	2.3	2.6	2.6	2.2
1992	2.2	2.1	1.6	2.4	3.3	2.5
1994		1.9		2.7		3.3
		2.0		2.4		2.6

of Educational Progress, *Almanac: Writing, 1984 to 1994*, 1996.

**Table S5-3 Standard errors for table 5-3**

Access to a computer and reason for use	Age 13						Age 17					
	1978	1982	1986	1990	1992	1994	1978	1982	1986	1990	1992	1994
Have access to												
computer in school	1.8	2.9	3.0	2.2	2.5	2.0	2.7	3.1	2.4	2.1	1.9	2.2
Study mathematics through												
computer instruction	0.9	2.3	2.5	1.8	2.4	1.8	1.1	1.5	1.5	2.1	2.0	1.7

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Almanac: Mathematics, 1978 to 1994*, 1996.

**Table S5-4 Standard errors for table 5-4**

Year	Ever used a computer		Family owns a computer	
	Age 9	Age 13	Age 9	Age 13
1986	1.2	1.2	1.3	1.5
1990	0.7	0.5	1.1	1.0
1992	0.8	0.3	1.0	1.1
1994	0.9	0.4	1.2	1.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Almanac: Science, 1986 to 1994*, 1996.

**Table S5(a) Standard errors for the first text table in *Indicator 5***

Frequency	Grade 4					Grade 8					Grade 11				
	1984	1988	1990	1992	1994	1984	1988	1990	1992	1994	1984	1988	1990	1992	1994
Never	3.5	4.2	2.3	1.6	2.0	4.2	3.1	2.6	2.7	2.7	2.9	2.4	2.2	2.4	2.4
Less than															
once a week	1.8	2.1	1.5	2.0	1.4	3.6	2.0	1.7	2.1	2.1	2.6	2.1	2.0	2.1	2.0
Once a week	3.1	3.4	2.3	2.3	3.0	2.8	1.9	1.8	1.8	1.8	1.5	1.6	1.1	1.6	1.4
2 or 3 times															
a week	1.7	2.3	2.1	1.8	3.0	1.9	1.6	1.7	2.0	1.3	1.3	1.4	1.2	1.3	1.6
Every day	1.3	1.1	1.1	1.1	1.4	1.5	1.7	1.7	1.4	1.8	2.0	2.0	1.3	1.5	1.9

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Almanac: Writing, 1984 to 1994*, 1996.

**Table S5(b) Standard errors for the second text table in *Indicator 5***

Reason	Grade 4					Grade 8					Grade 11				
	1984	1988	1990	1992	1994	1984	1988	1990	1992	1994	1984	1988	1990	1992	1994
To play games	3.7	2.5	1.9	1.6	1.8	3.7	1.7	1.7	1.7	1.4	2.5	1.7	1.4	1.8	2.0
To learn things	3.1	2.6	1.6	2.0	1.8	4.5	2.3	2.3	2.1	2.0	3.0	2.2	1.7	1.9	2.2
To write stories or papers	3.7	2.5	2.5	2.3	2.6	3.5	2.6	2.3	1.9	1.7	2.2	2.1	2.0	1.9	2.0

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Almanac: writing, 1984 to 1994*, 1996.

**Percentage of students who reported using a computer at school, by grade and frequency of use: Selected years 1984–94**

Frequency	Grade 4					Grade 8					Grade 11				
	1984	1988	1990	1992	1994	1984	1988	1990	1992	1994	1984	1988	1990	1992	1994
Never	61.2	29.8	18.9	16.5	14.0	66.7	41.8	40.5	37.6	27.7	55.0	44.7	44.9	27.2	26.1
Less than															
once a week	12.5	17.4	14.5	22.0	15.8	17.0	22.2	19.3	23.9	26.9	20.9	24.0	26.5	31.5	30.9
Once a week	15.5	34.2	41.1	37.0	39.6	8.1	13.9	12.9	12.8	16.1	5.7	6.4	6.6	10.8	8.0
2 or 3 times															
a week	7.6	15.0	17.7	18.6	22.8	4.6	12.2	16.0	15.1	14.5	6.3	9.7	8.3	11.3	12.4
Every day	3.2	3.6	7.8	5.9	7.7	3.6	9.8	11.3	10.5	14.9	12.1	15.2	13.7	19.2	22.6

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Almanac: Writing, 1984 to 1994*, 1996.

**Percentage of students who reported using a computer, by grade and reason for use:**

**Selected years 1984–94**

Reason	Grade 4					Grade 8					Grade 11				
	1984	1988	1990	1992	1994	1984	1988	1990	1992	1994	1984	1988	1990	1992	1994
To play games	71.8	79.0	84.5	82.8	87.4	84.1	85.3	83.7	84.7	86.8	75.7	78.9	79.0	78.4	76.6
To learn things	67.9	70.4	75.8	82.9	82.0	58.2	73.7	70.5	72.8	76.4	54.6	65.3	64.5	72.3	70.7
To write stories or papers	23.4	39.6	48.6	56.9	68.3	15.0	58.4	61.3	73.1	82.3	18.8	61.2	68.9	84.1	86.9

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Almanac: Writing, 1984 to 1994*, 1996.